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The *Selective* Renaissance of the Experimental Analysis of Human Behavior

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Two recent articles (Dougherty, Nedelmann, & Alfred, 1993; Hyten & Reilly, 1992) have favorably appraised the growth and health of the experimental analysis of human behavior as a whole. Within the last decade alone, there has been a more than threefold increase in the percentage of human operant papers appearing in the *Journal of the Experimental Analysis of Behavior.* In the present paper, a more molecular analysis is used, and some concerns are raised about the overall health of the field. The analysis included a determination of the rate at which new authors have appeared, how several areas of research have grown, and a contrast between the proportion of papers appearing in each of several areas of research during the last two decades. Two primary concerns are raised in this paper: (a) The recent growth within the field has been in only three select research areas (general schedule control, reinforcement, and stimulus control), and (b) there is an increasing disparity between the number of papers published in the few areas of research receiving the most attention and the number of papers published in the other areas of research receiving the least attention. Although the experimental analysis of human behavior has made considerable progress in the mere number of publications, these publications have been somewhat limited in scope.

Key words: human operant behavior, content areas, authors, publications, *Journal of the Experimental Analysis of Behavior*

Recently there has been good news regarding the growth of interest in the experimental analysis of human behavior (EAHB). Hyten and Reilly (1992) characterized this recent growth as a "renaissance" and commented that the EAHB has "made dramatic progress in a decade and is healthy and growing" (Hyten & Reilly, 1992, p. 109). Why should we question this good news? Within the last 10 years alone, the percentage of papers with humans as subjects published in the *Journal of the Experimental Analysis of Behavior* (*JEAB*) has approached 50%, compared to the meager 10% to 15% in the preceding decade (Dougherty, Nedelmann, & Alfred, 1993; Hyten & Reilly, 1992).

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However, additional data question whether EAHB is truly "healthy and growing." This skepticism stems from two questions. First, has there really been substantial growth within EAHB? Second, has the growth been across all of EAHB? The answer to the first question seems to depend on what comparison one chooses to gauge EAHB's growth. For example, the growth of EAHB has been substantial within the research published in *JEAB* alone. Recent data (Dougherty et al., 1993; Hyten & Reilly, 1992) indicate that EAHB has grown considerably, and if the current trends continue, EAHB will account for a majority of papers in *JEAB.* But EAHB occupies only a small niche within the field of psychology and in science as a whole. The present paper focuses on the second question and addresses it by presenting the results from both a general and a specific analysis of the growth within EAHB. First, a summary of the recent data is presented, indicating that EAHB is growing rapidly. Second, a summary of new data is presented, indicating that EAHB is growing rapidly but selectively.

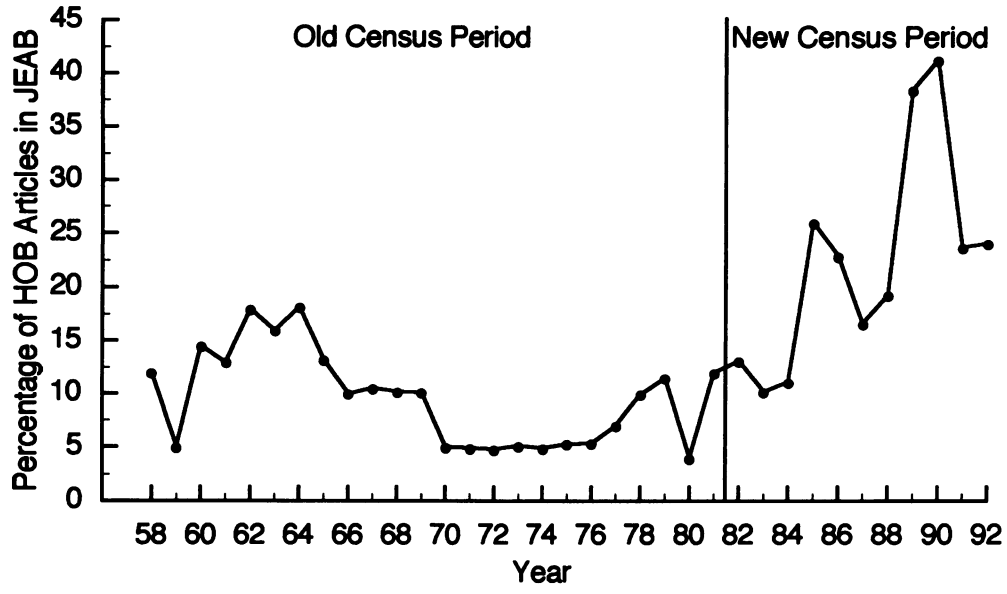

Figure 1. The percentage of basic human operant (data-based) studies appearing in the *Journal of the Experimental Analysis of Behavior* between 1958 and 1992. Points for each year between 1958 and 1981 were estimated from Buskist and Miller (1982a). (Reprinted by permission, from Dougherty et al., 1993.)

Global Measures of Growth Within the Experimental Analysis of Human Behavior

The percentage of data-based EAHB articles as compared to the total number of articles in *JEAB* has increased substantially within the last decade. As can be seen in Figure 1, most of this growth occurred immediately following the publication of Buskist and Miller's bibliography (1982b) and census (1982a). In recent years, the percentage of EAHB articles in *JEAB* has more than tripled the values seen at the end of the previous census period (marked by the vertical line). At its peak in 1990, EAHB articles accounted for approximately 42% of all data-based articles. Within the last 5 years, EAHB articles have averaged a 30% representation in *JEAB*. These trends are consistent with a similar analysis made by Hyten and Reilly (1992).

A global growth of EAHB is further supported by two other findings: (a) an increase in the number of new authors appearing within the last decade, and (b) an increase in the percentage of authors responsible for the papers appearing in *JEAB*. The total percentage of new authors contributing to *JEAB* during each of the last two decades appears in Figure 2. The number of new EAHB authors (only first authors were used to avoid inflations due to multiple authors) appearing in the most recent decade (1983–1992) has increased from 117 to 194 (a 40% increase). In comparison, the previous decade (1973–1982) had seen an increase from 76 to 113 authors (a 33% increase). In both decades, there has been a substantial increase in the number of new EAHB authors. These are large increases in comparison to the rate at which new authors have contributed to the literature on nonhumans. In the last decade (1983–1992), the number of authors studying nonhumans increased from 708 to 876 (a 19% increase), and in the preceding decade (1973–1982) the number of these authors increased from 414 to 691 (a 40% increase). In summary, during the last decade, the rate at which new authors have contributed to the literature on nonhumans has decreased considerably, and the rate at which new authors have appeared

in the literature on humans has increased considerably.

A second related finding concerns the changes in the percentage of authors responsible for the EAHB papers appearing in *JEAB*. Buskist and Miller determined that 10% of all authors having published EAHB papers accounted for more than 50% of the EAHB papers published in *JEAB* (between 1958 and 1981). In contrast, we found that in order to account for a similar percentage (50%) of papers between 1982 and 1992, 34% of the authors had to be included. In other words, during the last 10 years, the majority of papers were not being published by a minority of researchers.

Together, these two findings indicate that substantial growth has occurred and have no doubt led to the positive appraisals mentioned in the introduction. However, these conclusions may be premature. A more molecular level of analysis seems appropriate: Where has this growth occurred? This question became apparent during the construction of a topical bibliography of the human operant literature (Dougherty et al., 1993), because it appeared that the growth in the last decade has been fairly selective.

Nine Areas of Research Within EAHB and Their Growth

The information found in both the Buskist and Miller (1982b) and Dougherty et al. (1993) bibliographies shows where and how different EAHB areas of research have grown. Both bibliographies appear in topical form, and each is divided into nine content areas of research. These content areas and their descriptions (taken verbatim from Buskist & Miller, 1982a, p. 140) follow:

(i) Aversive Control of Behavior—studies concerning the effects of response cost, punishment, etc., and also studies which examined escape and avoidance behaviors; (ii) Choice and Preference—reports dealing with the manipulation of reinforcer frequency, reinforcer magnitude, or, in general, reinforcer value in concurrent operant procedures; (iii) Continuously Programmed Environments—reports of behavior in situations in which subjects are exposed to operant contingencies for prolonged periods of time; (iv) Cooperative Behavior—studies of cooperation, competition, or trusting behaviors involving two or more subjects; (v) General Schedule Performance—parametric investigations of human performance on various schedules of reinforcement; (vi) Instructions—reports of the role of instructions in controlling subjects' performances; (vii) Reinforcement—studies which report the unique aspects of the effects of reinforcement and extinction on behavior; (viii) Stimulus Control—studies dealing with the aspects of generalization and discrimination; and (ix) Verbal Behavior—studies which involve the acquisition and maintenance of conversation and vocalization.

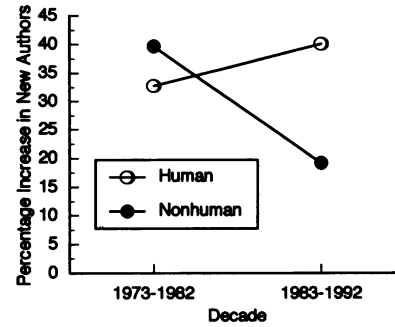

Figure 2. Shown are the percentage increases in the number of new authors appearing in the *Journal of the Experimental Analysis of Behavior* during the last two decades.

In both the Buskist and Miller (1982b) and Dougherty et al. (1993) bibliographies, a given study was categorized as belonging to more than one category if it fit more than one area. In order to determine how each of these nine areas has grown throughout *JEAB*'s history, the number of papers judged to have relevance to each of these nine areas during each journal year was counted. These numbers, converted to cumulative numbers, are plotted in Figure 3. Figure 3 shows several important trends. First, growth in three EAHB areas—reinforcement, stimulus control, and general schedule performance—in the last decade has accelerated, and together account for 297 of the 446 entries in both bibliographies (nearly 70% of all entries). Second, five areas—instructions, choice and preference, verbal behavior, cooperative behavior, and continuously programmed environments—each account for 30 entries or less (of the 447 entries) in both bibliographies (each of these areas accounts for less than 7% of the total number of entries). Third, growth in the

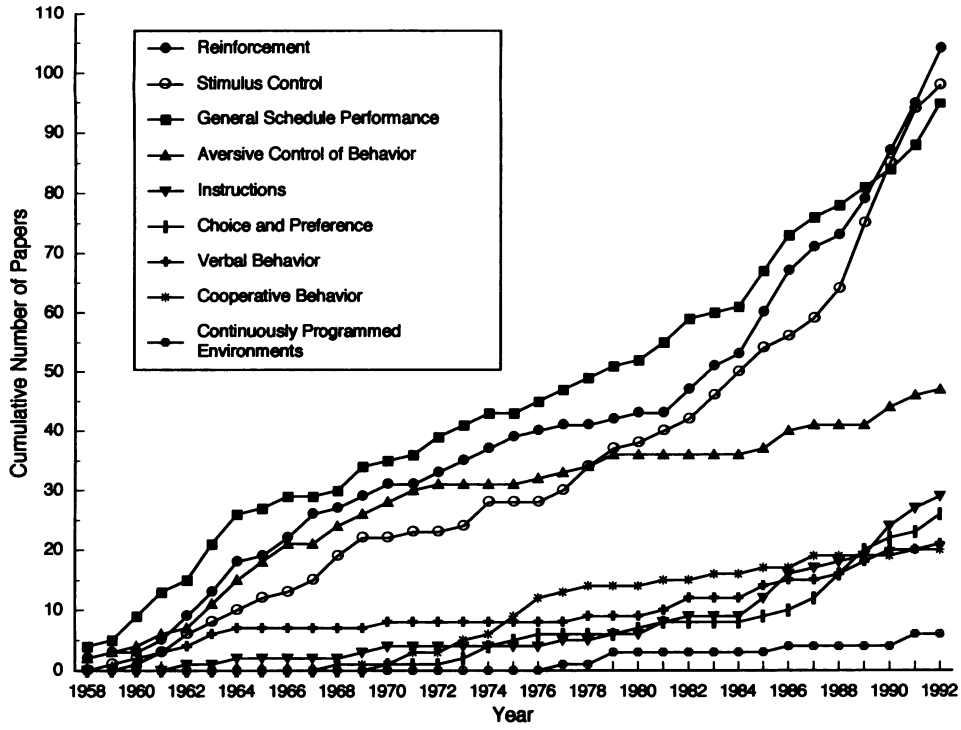

Figure 3. Shown are the cumulative number of papers appearing in the *Journal of the Experimental Analysis of Behavior* judged to have relevance to each of nine research areas.

area of aversive control of behavior has a trend different from that of all other areas; this area began by accelerating with the other three prominent areas but reached a plateau in the early 1970s. Fourth, some areas (aversive control of behavior, choice and preference, and instructions) have seen some small but recent trends upward. Finally, and perhaps the most striking trend, is the increasing separation between the three topic areas receiving the most attention (at the top of this figure) and those receiving the least attention (at the bottom of this figure), a separation that has widened in recent years. Those areas at the top of the figure are accelerating, whereas those at the bottom have grown little. Substantial growth has occurred only in select areas of research.

To look at EAHB's relative growth from a slightly different perspective, an additional comparison was made between the last two decades of research to determine how interests in these nine areas of research have changed. The distribution (or percentage) of papers within *JEAB* with relevance to each of these nine areas for each of the last two decades was calculated. (Again, these data were calculated using both the Buskist & Miller, 1982b, and the Dougherty et al., 1993, bibliographies.) The results from these calculations appear in Figure 4 and are grouped according to their growth: no change (<2% change), increase in representation (>2% increase), and decrease in representation (>2% decrease).

From the data in Figure 4, we conclude that (a) the percentage of research papers in each of three research areas—verbal behavior, aversive control of behavior, and choice and preference—has remained at nearly the same low level of representation (the differences being −0.36%, −0.57%, and +1.56%, respectively). Worth noting, however, is that two of these three areas have decreased slightly in representation. (b) The percentage of research papers in the areas of

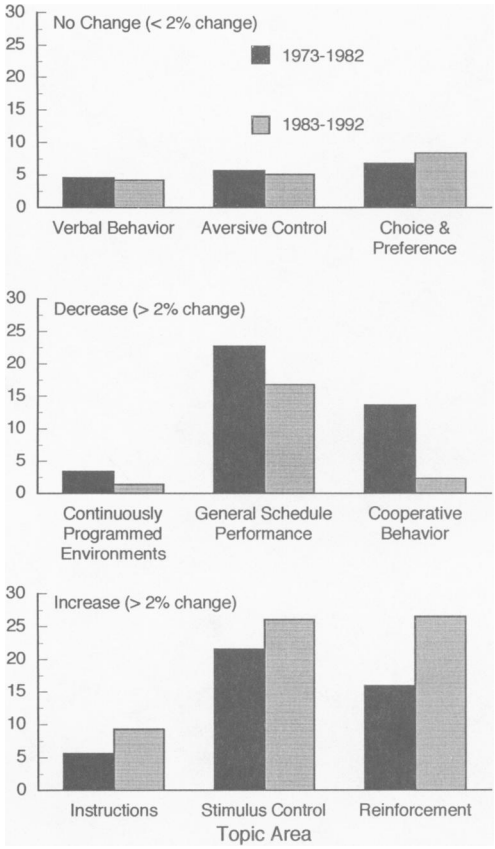

Figure 4. The percentage of the total number of papers during the last two decades falling into each of nine content areas of research are shown: areas with no change appear in the top panel, areas with decreases appear in the middle panel, and areas with increases appear in the bottom panel.

continuously programmed environments, general schedule performance, and cooperative behavior has decreased (by 2.01%, 5.98%, and 11.31%, respectively). (c) The percentage of research papers in the areas of instructions, stimulus control, and reinforcement has increased (by 3.69%, 4.45%, and 10.61%, respectively). (d) Despite the large overall representation of general schedule performance across all years in *JEAB*, the percentage of papers in this area has recently decreased (see Figure 3 for comparison). In summary, six of the nine areas have either shown no change or have decreased in representation while the other three have increased in representation. The scope of EAHB has narrowed to a point where only a few areas have substantial representation in *JEAB*.

In an additional analysis, the area of stimulus control was further subdivided because of the possibility that the recent increases were due to the growth in a single area of research: stimulus equivalence. Prior to the publication of the two leading articles on this topic (Sidman et al., 1982; Sidman & Tailby, 1982), research included stimulus generalization and discrimination, fading procedures, and errorless learning. In the last decade, however, the research on stimulus control has been nearly exclusively dominated by stimulus equivalence. During the last decade (1983–1992) there have been 60 articles. Of these, 44 have been concerned with stimulus equivalence.

Conclusions

Our most important finding is that only three of nine areas of research have grown substantially in the last decade, and together these three areas account for nearly 70% of the representation of all published EAHB papers in *JEAB*. At the same time, the representation in other areas of research has either remained relatively the same or has declined. Although these are possibly disturbing trends, we also must recognize that variability is certainly likely, given that science grows unevenly and the present analysis is based on a small sample of data. But this analysis should serve as a caution and remind us that other areas of research should not be neglected.

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